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JAPYGIDAE OF SOUTH AMERICA, 5: NEW SPECIES OF
JAPYGIDAE FROM CHILE

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In this paper the genus *Teljapyx* is revised and two new species, *T. hirsutus* González and Smith and *T. costalus* González and Smith are described. Two new combinations, *T. larva* (Philippi, 1863) and *T. bidentatus* (Schäffer, 1897) are proposed for this genus. The genus *Valpjapyx* Smith (1962) is subordinated to the genus *Teljapyx* Silvestri (1949). A new species is added to *Penjapyx*, namely *P. castrii*. Recent collection records are given for *Chiljapyx caltagironei* L. Smith, *Nelsjapyx hichinsi* L. Smith, *N. soldadi* L. Smith, and for *Rossjapyx australis* L. Smith. This paper is based largely on specimens collected by Dr. Francesco di Castri, University of Chile, Santiago, and loaned to the authors for study.

Teljapyx Silvestri 1949

(Syn. *Valpjapyx* L. Smith 1962)

This genus was redescribed by Smith (1962) at which time no males were available. With additional specimens, including males, the genus may be defined by the following summary characters:

One large tooth on each arm of the forceps, tooth on the right arm distinctly premedian, tooth on the left arm median, or postmedian, both arms of forceps with biseriate predental tubercles, basal buttress distinct on both arms of forceps, seta *A* of forceps present, sometimes as large as adjacent seta, dorsal articulation of forceps pointed, antenna with 30 to 46 segments, first lamina of lacinia pectinate, abdominal tergites IV and V with 5 + 5M and a large anterolateral pair (6 + 6M of Silvestri), posterolateral angles of tergite VII projected to the rear, of tergite VI not projected, tergite X with setae *a*, *b*, *c*, and *d* present, setose sacs in abdominal segments III and IV of the male, with two or more blunt, thumb-like plumose setae.

Type: *Teljapyx riestrae* Silv. 1949 (original description).

The species of the genus *Teljapyx* are as follows:

T. riestrae Silv. 1949, Temuco, Chile.

T. megalocerus Silv. 1902, Talcahuano, Chile. Syn. *Japyx chilensis* Verh.

T. bidentatus (Schäffer), 1897, Valparaiso, Chile. Syn. *Valpjapyx botani* Smith.

T. larva (Philippi) 1863, Colchagua, Chile. Syn. *Forficula larva* R. A. Philippi.

T. talcae (Smith) 1962, Talca, Chile. Syn. *Valpjapyx talcae* Smith.

T. hirsutus new species, O'Higgins, Chile.

T. costalus new species, Santiago, Chile.

T. afer Silv. 1949, Africa.

T. parvus Silv. 1949, Africa.

The species *T. afer* Silv. was described from Port Elizabeth, Africa, and *T. parvus* Silv. was described from Tanganyika, Africa. Pagés (1952) has shown that these two species do not fit the description of the genus, and consequently will not be further considered in this paper.

The species *T. megalocerus* was described by Silvestri in 1901 as *Japyx*, was named *Japyx chilensis* by Verhoeff in 1903, was redescribed by Silvestri in 1905, and was again described and placed in the genus *Teljapyx* by Silvestri, 1949. This species lacks setae between the carinae of tergite X, tergite VI has only 4 + 4M, tergite VII has 3 + 3M. Consequently, this species does not fit well into the genus *Teljapyx* and shall be omitted from this discussion.

The species of the genus *Teljapyx* are found in the valleys and low coastal hills (Cordillera de la Costa), from sea level to 2,000 feet elevation, and from Valparaiso on the north to Temuco on the south, a distance of 880 kilometers, or between latitudes 32°–39° south.

Teljapyx bidentatus (Schäffer), new combination

Japyx bidentatus Schäffer, 1897, in Apterygoten, Ergebn. Hamb.

Magalh. Samm.: 30–32 (Nec. *Japyx bidentatus*, Silvestri, 1901)

Valpjapyx botani L. Smith, 1962, Proc. Ent. Soc. Wash., 75: 277–278

Schäffer (1897) described *T. bidentatus* from Viña del Mar, Valparaiso, Chile. This species had 35 segments in the antennae, the posterior lateral angles of tergite VII projected to the rear, and M_1 was missing on tergites VI–VII. Silvestri (1901 and 1905) redescribed this species as having 32 segments in the antenna, posterolateral angles of tergite VII rounded, and M_1 was present on tergites VI–VII. In 1949 this species was again redescribed by Silvestri, and placed in the genus *Merojapyx*. However, it fits in all details into the genus *Teljapyx*, and differs from the type of *Merojapyx* in that it does not have disculi on the median subcoxal organ. We have studied three specimens from the Jardín Botánico Nacional, Viña del Mar, and one from Aculeo, Santiago, and all agree with Schäffer's original description. This species has been described in detail by Smith, 1962.

Teljapyx hirsutus, new species

(Figs. 1, 7, 9, 13)

Female: (Based on stage II). Head dorsum with about 15 + 15 typical setae and several hundred thin hair-like setae almost as long as the typical setae, distal lamina of lacinia with 13 or 14 teeth, lacinia falciform, rarely with a tooth, galea with two external setae (three in successive stages), galea with two external setae and a row of four projections, terminal segment of maxillary palpus with about 20 setae of various sizes, the longest, median, 1.7 times as long as stylus I, antenna with 40 segments, tapered, segment 3 of antenna with 45 setae of various lengths, not distinctly arranged in two whorls, segments 14 to 22 with posteroventral proliferation of setae between the basal and distal whorls, terminal segment of antenna not hemispherical, placoid sensillae 8 in two distinct whorls, trichobothria equal in length to the longest seta on the same segment, labial palpus somewhat tapered, three times as long as wide at the base with 16 setae of which the longest, terminal, almost as long as the palpus.

Thorax: Tergites 5, 6, 5 and many thin, hair-like setae, mesothorax prescutum with well-developed transverse and median apodemes, metathorax prescutum with strong transverse apodeme but no median, legs covered with hair-like setae, mesocoxa with 4 large setae, trochanter with 5 large setae, dorsal apex of femur with a close row of six setae as follows: one large, one medium, one large, one small, one large, and one small, ventral apex of tibia with two equal calcar setae, distinctly larger than other setae on the tibia, tarsi with 5 or 6 large setae in each ventral row (8 in stage IV), tarsal claws unequal, empodium subequal to pretarsus, directed upward.

Abdomen: Tergite I prescutum 1 + 1M, scutum 1 + 1M and many hair-like setae smaller than on the thorax, tergite II 3 + 3M and hair-like setae, diminishing on segments to the rear, tergites III-V 5 + 5M, and a large pair of anterolateral setae with the anteromedian pair minute or absent, tergites VI and VII 4 + 4M (M_1 absent), tergites I-VI with posterolateral angles rounded, tergite VII with angles projected to the rear, tergite VIII dorsal 4 + 4M, segment IX dorsal no setae, tergite X setae *a*, *b*, *c*, and *d* present with *d* half as long as *c*, dorsal carinae distinct, convergent, ventral carinae distinct, parallel, pygidium prominent, rounded. Sternum I apotome 4 + 5M alternating with 4 + 5m, sternite macrosetae indistinguishable from large antecedent setae, antecedent setae about 40 + 40, lateral subcoxal organs each occupying $\frac{1}{2}$ of the distance between the styli, sensory setae separated by width of one setal socket, setae $\frac{1}{3}$ as long as adjacent glandular setae, glandular setae in 3 rows, glandular setae in the posterior row one-third longer than those of the other two rows, median subcoxal area protruding with 3 + 3 setae on the posterior edge, no disculi or pseudopores. Sterna II-VI apotomes without setae, sternites 38 + 38M, sternite VII 20 + 20M, sternite VIII with 9 + 9M, sternite IX with pleurae not meeting in midventral line, segment X between the ventral carinae 10 + 10M or

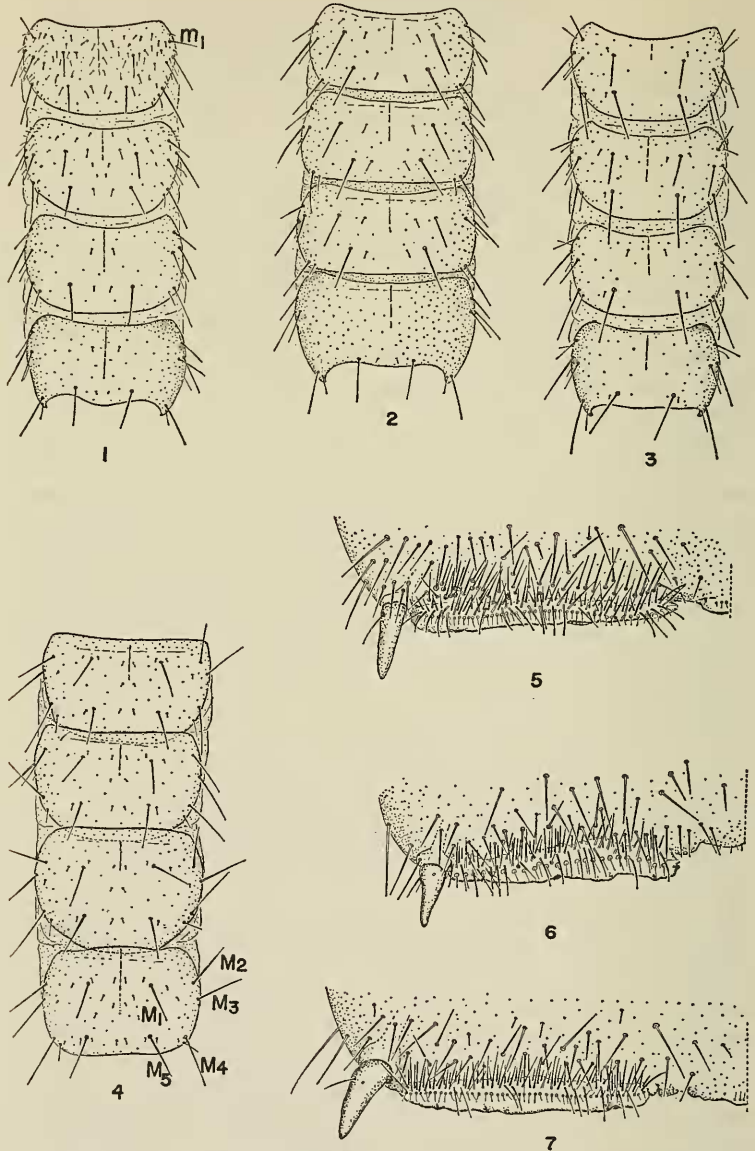


PLATE I. Figs. 1-4—Tergites IV-VIII of holotypes *T. hirsutus*, *T. larva*, *T. costalus*, and *P. castrii*; m_1 = anterolateral submacroseta; M = macrosetae. Figs. 5-7—Lateral subcoxal organ and half of median subcoxal organ of holotypes *T. costalus*, *T. larva*, and *T. hirsutus*.

11 + 11M, genital area typical with 2 to 4 small sensory setae on each anterior lobe, and a cluster of 5 to 8 similar setae at either side of the genital opening.

Forceps: Typical for the genus, right arm preidental tubercles 2/3, left arm tooth distinctly postmedian, preidental tubercles 9/9, seta A one-half as long as adjacent seta.

Male: Similar to female except, setose sacs in abdominal segments III and IV containing short, thick, blunt setae, widely separated, covered with uniramous or bifid projections and minute spicules (Fig. 13) and preceded by 5 + 5 (or 6 + 6 in male stage VI) short sensory setae placed near the anterior margin of each urite; genital papillae conical, nearly as wide at the base as long, external sensory setae 2 + 2 in stage II and 3 + 3 in successive stages, distributed by pairs and widely spaced; forceps, right arm preidental tubercles 2/3, left arm preidental tubercles 8/9.

Teljapyx hirsutus—differentiation into stages*

Body length, mm	Distance between Styli I, mm	Glandular setae (longest) on one side	External setae on galea	Ratio length adjacent seta: seta A	Setae in each setose sac	Stage
<i>Females</i>						
7.0	0.4	11	1	1:0.1		3rd instar juvenile
12.0	0.7	17	2	1:0.2		Stage II
14.0	1.1	23	3	1:0.4		Stage III
18.0	1.2	32	3	1:0.5		Stage IV
23.0	1.6	40	3	1:0.5		Stage V
<i>Males</i>						
13.0	0.9	18	2	1:0.25	2 + 1	Stage II
20.0	1.3	33	3	1:0.4	8 + 9	Stage IV
26.0	1.7	45	3	1:0.7	19 + 19	Stage VI

* Figures averaged when more than one specimen was available

Type: Holotype ♀ in University of Chile, Santiago, paratypes in U. S. National Museum and University of California, Davis.

Habitat: 2 juveniles, 5 ♀ and 3 ♂, Palmas de Cocalán, Province of O'Higgins, 34°12' S, 71°20' W, under stones, in open forest of *Jubaea chilensis*, at 700–800 meters elevation, 5 August 1961 and 6 September 1962, collected by Dr. F. di Castri.

Teljapyx larva (Philippi), new combination
(Figs. 2, 6, 11, 14)

Forficula ? larva Philippi, 1863. Zeischr. Ges. Naturw., 21 (3–4): 219

Typholabia larva (Philippi), Scudder, 1876. Boston Soc. Nat. Hist. Proc., 18: 300

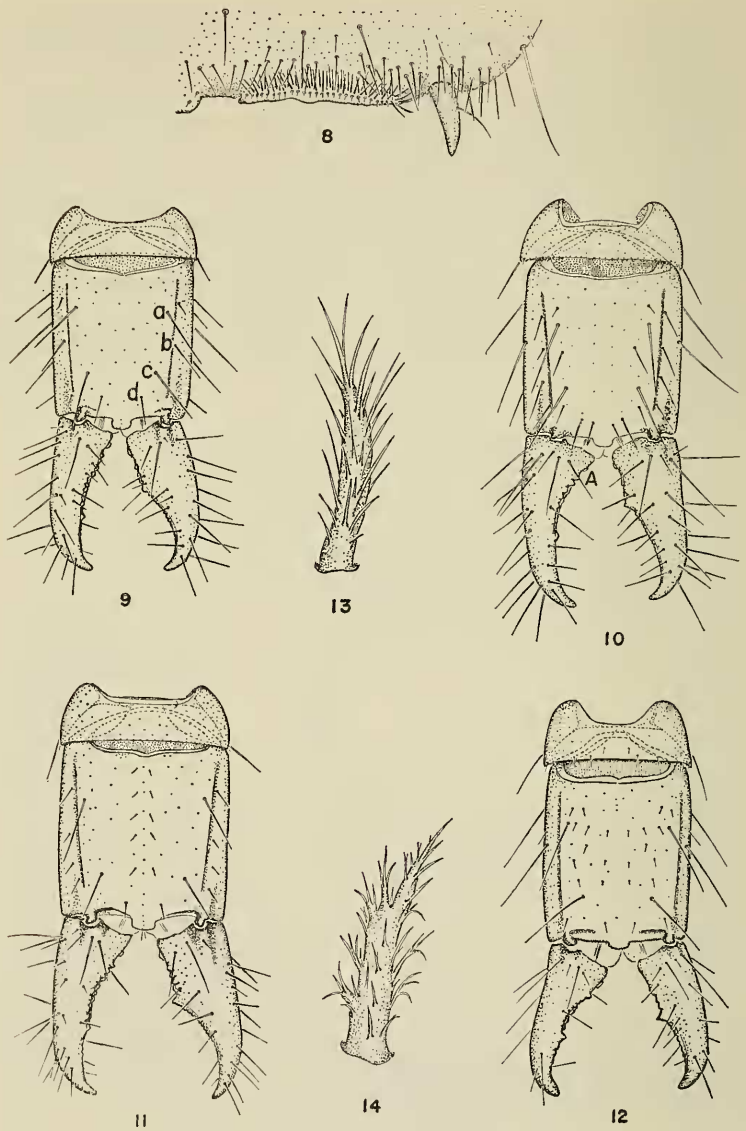


PLATE II. Fig. 8—Lateral subcoxal organ and half of median subcoxal organ, *P. castrii* ♂ allotype. Figs. 9–12—Tergite X and forceps of holotypes *T. hirsutus*, *T. costalus*, *T. larva*, and *P. castrii*. Figs. 13–14—Setae of male setose sac, *T. hirsutus* and *T. larva*.

Japyx larva (Philippi), de Bormans, 1887. Soc. Ent. Belg. Bull. et Ann., 31: 495

R. A. Philippi (1863), in his revision of the Chilean Orthoptera existing at that time in the Museum of Natural History, Santiago, described this species as belonging to the order Dermaptera, and no drawings were provided. Due to the "remarkable" characters that Scudder (1876) found in the species' description which made it resemble no known forficularians at that time, he erected the new genus *Typhlolabia* (which is hereby declared *nomen oblitum*) for the reception of this species. De Bormans and Marquet in 1883 considered this genus as doubtful but nevertheless they added a new species, *T. subterranea*. Later in 1887, Karsch placed Philippi's species among the Japygidae but independently de Bormans (1887) consolidated this action by removing both known species of *Typhlolabia* to the genus *Japyx*.

Through the courtesy of Dr. G. Kuschel and Dr. F. di Castri of the University of Chile, we have been able to examine the type specimen of *F. larva* deposited in the Museum of Natural History, Santiago. The holotype, a pinned specimen, was in excellent condition, and has been remounted in permanent medium after a clearing and staining in lacto-phenol-lignin pink. Since Philippi's description, probably the first one ever made of a japygid,* was very schematic, it is worthwhile to present the following redescription:

Male: Close to *T. hirsutus* González and Smith, except: antenna with 41 segments, lacinia with a flange, longest seta on maxillary palpus 2.0 times as long as stylus I, segment 3 of antenna with 58 setae, placoid sensillae 8 in two distinct whorls, labial palpus with 20 setae, galea with 3 outer setae widely spaced, head, thoracic tergites, and legs all clothed with many small hair-like setae, abdominal segment VI with seta M₁ present, lateral subcoxal organs with three rows of glandular setae, those in the posterior row one-third longer than those on the other two rows, the longer glandular setae of the anterior row and separated by width of one setal socket, median subcoxal organ 4 + 4, setose sacs in urites III-IV each with 18 plumose setae in one single spot, plumose setae of setose sacs with shorter and more branched barbulations than those of *T. hirsutus* (Fig. 14); styli with two unequal setae on the external margin, genital papillae 1.5 times as long as wide at the base, with typical dense setae on mesad surface, sparser setae on laterad surface, and seven minute sense setae irregularly arranged from base to tip, forceps seta A subequal to adjacent seta, right arm with large premedian tooth, premedian tubercles biseriolate 3/3, left arm with postmedian tooth, prepedal tubercles 8/12 with the first two tubercles in the lower row modified to toothlets.

Length of body including forceps: 17 mm; separation between styli I 1.6 mm.

Female unknown.

* The genus *Japyx* was established by Haliday in 1864.

Teljapyx talcae (Smith)(Syn. *Valpjapyx talcae* Smith 1962)

The species *Valpjapyx talcae* was described by L. Smith in 1962 from one female and two juveniles, taken 22 miles north of Talca, Chile. No additional specimens are at hand, but a better knowledge of the genus *Teljapyx* enables the authors to place this species in this genus. However, the presence of 3 whorls of sensilla placoidea in the last antennal segment and the noticeable proliferation of antecedent setae in the area of the lateral subcoxal organ, constitute exclusive characters not found in other species of the genus.

***Teljapyx costalus*, new species**

(Figs. 2, 5, 10)

Male: (Described from stage III). Similar to *T. hirsutus* González and Smith, except: head with about one-fourth as many hair-like setae, galea with a row of 3 external setae of which the two anterior are close together, longest (median) seta on maxillary palpus 1.2 times as long as stylus I, antenna with 46 segments, segment III of antenna with 40 setae, segments 14 to 24 with posteroventral proliferation of setae between the basal and distal whorls, trichobothria two-thirds as long as longest setae on same segment, thoracic tergites and legs without a dense coat of hair-like setae, trochanter with 7 large setae, abdominal tergites without hair-like setae, tergites III-V 5 + 5M and a large pair of anterolateral setae (m_1 of Pagés) and M_1 , decreasing in size on each posterior tergite, tergites VI and VII 4 + 4M (M_1 absent) and a pair of large anterolateral setae, tergite VI posterolateral angles obtuse, tergite X with seta d $\frac{3}{4}$ as long as c , and 4 large m between the carinae, sternite I with 85 + 85 antecedent setae closely grouped anterior to lateral subcoxal organs, not continuous across median subcoxal area, median subcoxal organ with 4 + 5 microsetae in a straight line on the posterior edge, sternites II and III with a straight line of 22 setae plus a few microsetae between the bases of the styli, male sac in urite III with 2 + 1 plumose setae, sac in urite IV with 2 + 2 setae in widely separated pairs, forceps: right arm predental tubercles 1/2, left arm predental tubercles 8/8, seta A three-fourths as long as adjacent seta.

Female unknown.

Length of body including forceps 18 mm.

Type: Holotype ♂ in Univ. of Chile, Santiago.

Habitat: One ♂ and one juvenile, Aculeo, Province of Santiago, Chile, 33°50' S, 70°56' W, in the Cordillera de la Costa at 450 meters elevation, under stones, 7 July 1961, collected by Dr. F. di Castri.

Teljapyx profundus Smith 1962 possesses most of the characters of the genus *Teljapyx* except that the predental tubercles of the right arm are uniseriate. No males of this species are known. When males are studied, the nature of the male setose sacs will determine if this species should belong in this genus. Until such time the species is regarded as *incaerta sedis*. The species was described in detail by Smith (1962).

KEY TO THE CHILEAN SPECIES OF THE GENUS *Teljapyx*

1. Seta M_1 present on tergite VII 2
 Seta M_1 absent on tergite VII 3
2. Antenna with 30 segments; right arm of forceps biseriate 2/3
 *T. riestrae* Silv.
 Antenna with 44 segments; right arm of forceps preidental tubercles
 3/4 *T. talcae* (Smith)
3. Seta M_1 present on tergite VI; median subcoxal organ with 4 + 4
 microsetae; styli with 2 external setae *T. larva* (Philippi)
 Seta M_1 absent on tergite VI; median subcoxal organ with 3 + 3
 microsetae; styli with a single setae 4
4. Head, thorax and tergites I-IV densely covered with numerous
 thin, hair-like setae; sternum VIII with 9 + 9M *T. hirsutus* G. & S.
 Without such hair-like setae; sternum VIII with 8 + 8 or 10 + 10M 5
5. Five large setae on trochanter, sternum VIII with 8 + 8M, seta
 A of forceps one-third as long as adjacent seta, antenna with
 35 segments *T. bidentatus* (Schäf.)
 Seven large setae on trochanter, sternum VIII with 10 + 10M, seta
 A of forceps three-fourths as long as adjacent seta, antenna with
 46 segments *T. costalus* G. & S.

***Penjapyx castrii*, new species**

(Figs. 4, 8, 12)

Female: Head with 9 + 9M and a few microsetae, distal lamina of lacinia with 7 teeth, galea with one external seta, thumb of galea sclerotized with 10-15 projections, not hooked, terminal segment of maxillary palpus with 10 setae of various sizes, the largest of which 1.8 times the length of the palpal segment, mandible with 4 teeth and a slight projection indicating the fifth tooth, antenna with 30 segments, segment 3 of antenna with a distal whorl of 13 setae, 6 of which long, basal whorl of 9 setae, 3 of which long, segments 8 to 13 with posteroventral proliferation of setae, terminal segment longer than wide, placoid sensillae 6 in two whorls, trichobothria half as long as longest seta on same segment, labial palpus tapered, with 8 setae, two terminal of which slightly longer than the palpus.

Thorax: Pro-5 + 5M, meso-prescutum 1 + 1M, scutum 4 + 4M, meta-prescutum 1 + 1M, scutum 4 + 4M (posteromedian pair absent), meso-coxa with 4 large setae, trochanter with 4 large setae, metatarsus with 7 large setae per ventral row, empodium a small swelling on the pretarsus.

Abdomen: Tergite I prescutum 1 + 1M, scutum 1 + 1M, tergites II-VII 5 + 5M, anterolateral seta *m.* missing, angles rounded, tergite VIII dorsal 6 + 6M, tergite X setae *a* and *c* large, *b* and *d* minute, sternum I apotome 3 + 3M, sternite 11 + 11M, antecedent setae, a group of 7 laterad of each stylus, 16 + 18 anterior to lateral subcoxal organs, and 4 + 4 anterior to median area, lateral subcoxal organs each occupying one-fourth of the distance between the styli, composed of one row of

equal glandular setae 25 + 26 and sensory setae separated by the width of one setal socket, median subcoxal organ with 2 + 2 setae located at either side, sterna II-VII apotomes without setae, sternites II-VI 14 + 14M, sternite VII 13 + 13M, sternite VIII 7 + 7M, segment IX pleurae not meeting in midventral line, segment X between ventral carinae 9 + 9M, and 1 + 1m posteromedian.

Forceps: Dentition typical for the genus, left arm preidental tubercles 8/5, R = 2.29.

Male: Similar to female except: lateral subcoxal organ composed of two rows of glandular setae 50 + 50. R = 2.22, genital papillae 1.5 times as long as wide, mesad surface with about 35 short thin setae, laterad surface without setae.

Length of body including forceps: ♀ 10 mm, ♂ 10.5 mm.

Types: Holotype ♀ in Univ. of Chile, Santiago, paratype ♂ in Calif. Academy of Sciences.

Habitat: One male and one female, Los Andes, Province of Aconcagua, Chile, 16-VIII-1962, collected by Dr. F. di Castri.

KEY TO THE SPECIES OF *Penjapyx*

- Antenna with 32 segments, thorax mesoscutum 5 + 5M, metascutum 5 + 5M, sternite VI 15 + 15M, sternite VII 14 + 14M, left arm preidental tubercles 4/4, R ♂ = 1.67 *P. altus* Smith
- Antenna with 30 segments, thorax mesoscutum 4 + 4M and 1 + 1m, metascutum 4 + 4M, sternite VI 14 + 14M, sternite VII 13 + 13M, left arm preidental tubercles 8/5, R ♂ = 2.22 *P. castrii* G. & S.

New collection records for existing species are as follows:

Rossjapyx australis L. Smith, one ♂ and 2 ♀, Dalcahue, Chiloé Island, Chile, 17 to 23 Jan. 1962, collected by Dr. R. L. Usinger.

Nelsjapyx hichinsi L. Smith, one ♀, Quebrada La Plata, Estacion Experimental Agronómica, Maipú, Santiago, at 30 cm depth, 600 m elevation, xerophytic plant cover of *Trichocereus chilensis* and *Trevoa trinervis*, 16-VI-1961, collected by F. di Castri.

Nelsjapyx soldadi L. Smith, a stage II ♂ showing two rows of glandular setae on the lateral subcoxal organs, Zapallar, Cordillera de la Costa, Aconcagua, 700 m elevation, 40 cm depth, 26-I-1961; one ♀ and 2 juveniles, Hacienda Las Palmas, Coquimbo Province, 31°15' S, 71°38' W, 26-V-1962, collected by F. di Castri.

Chiljapyx caltagironei L. Smith, 2 ♂ and 5 ♀, Aculeo, Santiago Province, 400 m elevation, 20 cm depth, 7-VII-1961; 6 ♂ and 5 ♀, Palmas de Cocalán, O'Higgins Province, 900 m elevation, 30 cm depth and under stones, 5-VIII-1961, by F. di Castri.

LITERATURE CITED

- BORMANS, A. DE. 1887. Le genre *Japyx* Haliday, appartient-il à l'ordre des Orthoptères (famille des Demaptères), ou à l'ordre des Thysanoures? Soc. Ent. Belg. Bull. et Ann., 31: 495-497.

- BORMANS, A. DE AND M. MARQUET. 1883. Etude sur le genre *Typhloblabia* Scudder et description d'une espèce nouvelle. Soc. d'Hist. Nat. de Toulouse, 17: 33-40.
- KARSCH, F. 1887. Neue Fundorte von *Japyx* Hal. Berliner Entomolog. Zeitschrift, 31 (2): 154.
- PAGÉS, J. 1952. Japygidae (Insecta, Diplura) du Congo Belge (Première note). Rev. Zool. Bot. Afr., 46 (3-4): 345-372.
- PHILIPPI, R. A. 1863. Verzeichniss der im Museum von Santiago befindlichen Chilenischen Orthopteren. Zeitschr. Ges. Naturw., 21 (3-4): 217-245.
- SCHÄFFER, C. 1897. Apterygoten. Ergebn. Hamburger Magalhaenische Sammelreise, pp. 1-48.
- SCUDDER, S. H. 1876. Critical and historical notes on Forficulariae, including descriptions of new generic forms and an alphabetical synonymic list of the described species. Boston Soc. Nat. Hist. Proc., 18 (for 1877): 287-332.
- SILVESTRI, F. 1901. Materiali per lo Studio dei Tisanuri, II. Specie di *Japyx* conservate nella mia collezione. Soc. Ent. Ital. Boll., 33: 214.
- . 1905. Thysanura, in Plate's Fauna Chilensis. Zoologische Jahrbucher, Supp. 16, 3: 773-806.
- . 1949. Contributo alla conoscenza degli Japygidae (Insecta, Diplura). Rendiconti Soc. Ital. della Scienze., Serie III, 27: 1-117.
- SMITH, L. M. 1962. Japygidae of South America, 3: Japygidae of Chile. Proc. Biol. Soc. Wash., 75: 273-292.
- VERHOEFF, K. W. 1904. Zur vergleichenden Morphologie und Systematik der Japygiden. Arch. Naturg., 70 (1): 63-114.